

### **REMARKS**

Claims 1-26 are pending in the above-identified application. Claims 1-19 and 22-26 were rejected and claims 20 and 21 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. In this Amendment, claims 1-26 were amended. Accordingly, claims 1-26 remain at issue. Unless otherwise noted herein, Applicants submit that the claims have been amended to correct cosmetic or grammatical errors.

#### **I. Objection To Claims**

Claim 19 was amended to correct informalities noted by the Examiner. Claims 20 and 21 were deemed allowable if rewritten in independent form. Accordingly, Claim 20 has been amended to incorporate the base independent claim 15 and intervening claims 16 and 17. Claim 21 depends from Claim 20. Thus, Applicants respectfully submit that Claims 20 and 21 are in condition for allowance.

#### **II. 35 U.S.C. § 112 Indefiniteness Rejection of Claims**

Claims 9, 10 and 23 were rejected under 35 U.S.C. § 112 for indefiniteness. In particular, the Examiner notes that these claims have limitations that the fixed and movable sections of a hinge section are formed on a first surface of the substrate, and the mirror section is formed on a second surface of the substrate. But the Examiner argues that these claims depend from a claim that requires that the hinge section and the mirror section be integrally formed. Applicants disagree that Claims 9, 10, and 23 are indefinite and respectfully traverse this rejection.

With respect to Claims 9 and 23, Applicants claim micro-mirror and a method for fabricating a micro-mirror that has the following limitation, among others:

*said fixed section and the movable section of the hinge section are formed on a first crystal surface of the silicon substrate; and said mirror section is formed on a second crystal surface of the silicon substrate.*

(See Application at pg. 8 lines 7-13 and Fig. 5D)

Claims 9 and 23 depend from Claims 7 and 15, respectively. Claims 7 and 15 require the micro-mirror to have the limitation that "said hinge section and said mirror section are integrally constructed by a structured film formed on a semiconductor substrate." (See Application at pg. 8 lines 14-17, pg. 9 lines 25-28; Figs. 6A and 8B). Applicants teach that the structured film from which both the hinge section and the mirror section are integrally formed maybe nitride silicon film 27, which is formed on two different surfaces (100 and 111) of the substrate to form the mirror section 12 and the hinged section 13 as taught and claimed by the Applicants. Therefore, Applicants submit the claim terms used in Claims 9, 10, and 23 are clearly supported in the Application and have proper antecedent basis. Accordingly, Applicants respectfully request that the rejection to these claims be withdrawn.

### **III. 35 U.S.C. § 102 Anticipation Rejection of Claims and 35 U.S.C. § 103 Obviousness Rejection of Claims**

Claims 1-8, 13-16 and 22 were rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by *Mitchell* (US 6,587,612). Claims 11, 12, 14, 17-19, 24 and 25 were rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over *Mitchell* in view of *Scolgaard* (US 6,389,190). Applicants respectfully traverse these rejections.

With respect to independent claims 1, 13, and 15 as amended, Applicants teach and claim a micro-mirror 10 that has a mirror section 12 for reflecting an incident light at a relative angle (e.g., R1 in Fig. 3). The micro-mirror 10 also has a hinge section 13 that includes a fixed section 13A and a movable section 13B each having a flat surface. The mirror section 12 and the hinge section 13 are integrally formed such that the mirror section 12 extends from the movable section 13B of the hinge section and is slanted by approximately 55 degrees to the flat surface (100 in Fig. 5D) of the movable section of the hinge section. The micro-mirror also includes a drive means that has a bi-morph structure made of two or more of materials (e.g., poly-crystal silicon film 15 and aluminum film 16) having different heat expansion coefficients for deflecting said mirror section to change the relative angle to the incident light. (See Application at pg. 6 lines 4-25, Fig. 4). Applicants teach that, by forming the mirror section to extend at a slant angle from the end of the movable section of the hinge section, the mirror section can be moved at a high speed to deflect incident light in accordance with the change in the movable section so that the micro-mirror is able to scan a wide bar number or other image.

*Mitchell* teaches a thermally actuated optical switch that uses a thermally actuated or bimorph cantilever 40 or 300 to move a mirror 25 or 225 mounted to the cantilever 40 or 300. (See *Mitchell* Col. 4, lines 39-44; Col. 5, lines 20-21; Col. 6, lines 14-17; Fig. 2B, 3, 4A, 5A, and 6A-B). *Mitchell*, however, fails to disclose a micro-mirror that has a mirror section that is integrally formed with a hinge section such that the mirror section extends from the movable section of the hinge section and is slanted to said flat surface of the movable section of the hinge section. Furthermore, *Mitchell*, discloses that the cantilevers 40 or 300 are adapted to move the mirror in and out of the incident light or orient the mirror for the incident light. (See *Mitchell*

Col. 4, lines 39-44). Thus, *Mitchell* fails to disclose a micro-mirror formed as described in claims 1, 13, and 15 in which the mirror section 12 is deflected to change the relative angle at which incident light is reflected for scanning an image.

Accordingly, Applicants submit that *Mitchell* fails to disclose all the limitations of independent Claims 1, 13, and 15, and respectfully requests that the rejection to these claims be withdrawn.

Claims 2-12 depend from Claim 1 and should be deemed allowable for at least the same reasons as Claim 1. Claim 14 depends from Claim 13 and should be deemed allowable for at least the same reasons as Claim 13. Claims 16-22 depend from Claim 15 and should be deemed allowable for at least the same reasons as Claim 15. Therefore, Applicants respectfully request that the rejection to these dependent claims be withdrawn.

**IV. Conclusion**

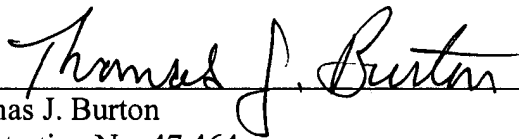
In view of the above amendments and remarks, Applicants submit that all claims are clearly allowable over the cited prior art, and respectfully request early and favorable notification to that effect.

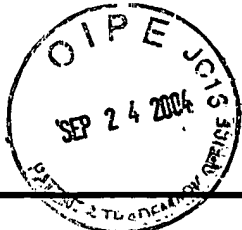
Should anything further be required, or if the prosecution of the present patent application may be advanced by a telephone conference, the Examiner is respectfully requested to call the undersigned at (312) 876-8000.

Respectfully submitted,

Dated: September 21, 2004

By: \_\_\_\_\_

  
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SEP 29 2004

<b>TRANSMITTAL FORM</b> (to be used for all correspondence after initial filing)	Application Number	10/092,771
	Filing Date	March 7, 2002
	First Named Inventor	Masaki Hara
	Group Art Unit	2872
	Examiner Name	Pritchett, Joshua L.
Total Number of Pages in This Submission	Attorney Docket Number	09792909-5355

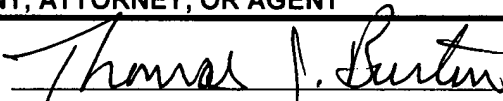
**ENCLOSURES** (check all that apply)

- ☒ Transmitted herewith is Response to June 29, 2004 Office Action
- ☒ The fee has been calculated as shown below:

(1) FOR	(2) CLAIMS REMAINING AFTER AMENDMENT	(3)	(4) HIGHEST NO. PREVIOUSLY PAID FOR	(5) PRESENT EXTRA	(6) RATE	(7) ADDITIONAL FEE
TOTAL CLAIMS	26	-	26	0	<input type="checkbox"/> x \$9.00 <input type="checkbox"/> x \$18.00	\$0
INDEPENDENT CLAIMS	4	-	3	1	<input type="checkbox"/> x \$43.00 <input checked="" type="checkbox"/> x \$86.00	\$86.00
	APPLICATION AMENDED TO CONTAIN ANY MULTIPLE DEPENDENT CLAIMS NOT PREVIOUSLY PAID FOR.			<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	<input type="checkbox"/> x \$145.00 <input type="checkbox"/> x \$290.00 ONE TIME	\$
	TOTAL ADDITIONAL FEE FOR THIS AMENDMENT					\$86.00

- ☐ Applicant petitions the Commissioner for Patents to extend the time for responding to the Office Action dated \_\_\_\_\_ by one month(s) for a fee of \$ \_\_\_\_\_ so that the period for response is extended to \_\_\_\_\_ under 37 C.F.R. § 1.321.
- ☐ The amount of \$ \_\_\_\_\_ for the Terminal Disclaimer under 37 C.F.R. § 1.321 is included in the enclosed check.
- ☒ The enclosed credit card payment form to charge the amount of **\$86.00** covers the total claim fee and other applicable fees.
- ☒ The Commissioner is hereby authorized to charge the extension fee and any additional fees which may be required, or to credit any overpayment to Account No. 19-3140. **A duplicate of this sheet is enclosed.**

**SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT**14. ☒ Customer No. 26263Dated: September 21, 2004

  
Thomas J. Burton (Registration No. 47,464)

**CERTIFICATE OF MAILING**

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop Amendment Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date indicated below.

Dated: September 21, 2004

  
Lynne M. Anglemire



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**TRANSMITTAL  
FORM**

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission	Application Number	10/092,711
	Filing Date	March 7, 2002
	First Named Inventor	Masaki Hara
	Group Art Unit	2872
	Examiner Name	Pritchett, Joshua L.
	Attorney Docket Number	09792909-5355

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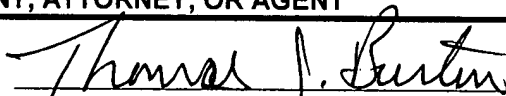
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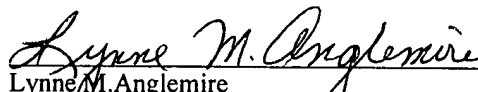
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Dated: September 21, 2004

  
Lynne M. Anglemire